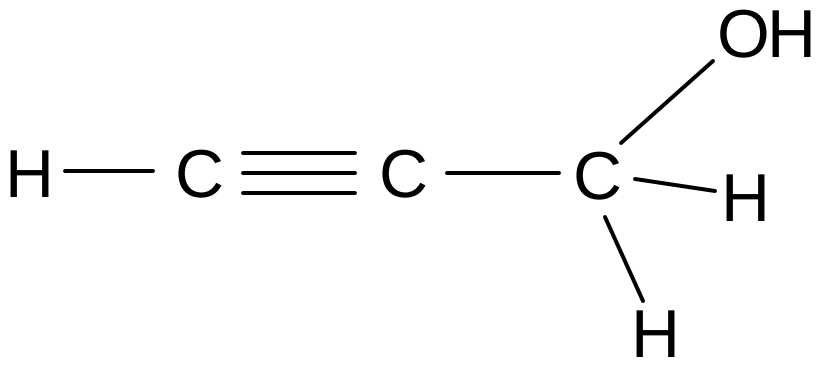
Propargyl Alcohol



CAS Number 107-19-7

Existing Chemical	:	ID: 107-19-7
Memo	:	Propargyl alcohol
CAS No.	:	107-19-7
Common name	:	Propargyl alcohol
EINECS Name	:	prop-2-yn-1-ol
Molecular Weight	:	56.06
ELINCS number	:	203-471-2
Molecular Formula	:	C3 H4 O

Printing date	:	24.07.2003
Revision date	:	
Date of last update	:	24.07.2003
Number of pages	:	42
Chapter (profile)	:	Chapter: 1.0.1, 1.2, 2.1, 2.2, 2.3, 2.4, 2.5, 2.6.1, 3.1.1, 3.1.2, 3.3.1, 3.3.2, 3.5, 4.1, 4.2, 4.3, 4.4, 5.1.1, 5.1.2, 5.1.3, 5.1.4, 5.4, 5.5, 5.6, 5.7, 5.8.1, 5.8.2
Reliability (profile)	:	Reliability: without reliability, 1, 2, 3, 4
Flags (profile)	:	Flags: without flag, confidential, non confidential, WGK (DE), TA-Luft (DE), Material Safety Dataset, Risk Assessment, Directive 67/548/EEC, SIDS

1.0.1 APPLICANT AND COMPANY INFORMATION

Type	:	lead organisation
Name	:	Toxicology and Regulatory Affairs
Contact person	:	Elmer Rauckman
Date	:	
Street	:	1201 Anise Court
Town	:	62243 Freeburg, Illinois
Country	:	United States
Phone	:	618-539-5280
Telefax	:	
Telex	:	
Cedex	:	
Email	:	rauckman@toxicsolutions.com
Homepage	:	toxicsolutions.com

Remark : This document has been prepared on behalf of the Propargyl Alcohol Producers Consortium known as the BPPB Consortium

Participating Members

BASF Corporation
International Specialty Products

31.12.2002

1.2 SYNONYMS AND TRADENAMES

2.1 MELTING POINT

Value : = -52 - -48 °C

Test substance :
Propargyl alcohol, CASNO 107-19-7

Reliability : (2) valid with restrictions
Handbook data are assigned reliability of 2

09.12.2002 (25)

2.2 BOILING POINT

Value : = 114 - 115 °C at 1013 hPa

Test substance :
Propargyl alcohol, CASNO 107-19-7

Reliability : (2) valid with restrictions
Handbook data are assigned reliability of 2

09.12.2002 (25)

2.3 DENSITY

Type : relative density
Value : = .9715 at 20 °C

Test substance : Propargyl alcohol, CASNO 107-19-7
Reliability : (2) valid with restrictions
Handbook data are assigned reliability of 2

09.12.2002 (25)

2.4 VAPOUR PRESSURE

Value : = 15.5 hPa at 20 °C

Test substance :
Propargyl alcohol, CASNO 107-19-7

Reliability : (2) valid with restrictions
Handbook data are assigned reliability of 2

09.12.2002 (27)

Value : = 20.75 hPa at 25 °C

Remark : Given in reference as 15.6 mm Hg, converted to hPa
Test substance : Propargyl alcohol, CASNO 107-19-7
Reliability : (2) valid with restrictions
Handbook data are assigned reliability of 2

09.12.2002 (15)

2.5 PARTITION COEFFICIENT

Partition coefficient : octanol-water
Log pow : = -.35 at 25 °C
pH value :
Method : OECD Guide-line 107 "Partition Coefficient (n-octanol/water), Flask-shaking Method"
Year :
GLP : no data
Test substance :

Test substance :
Propargyl alcohol, CASNO 107-19-7
Reliability : (1) valid without restriction
Modern guideline study
30.12.2002 (6)

Partition coefficient : octanol-water
Log pow : = -.38 at 25 °C
pH value :

Test substance :
Propargyl alcohol, CASNO 107-19-7
Reliability : (2) valid with restrictions
15.12.2002 (19)

2.6.1 SOLUBILITY IN DIFFERENT MEDIA

Solubility in : Water
Value : at °C
pH value :
concentration : at °C
Temperature effects :
Examine different pol. :
pKa : at 25 °C
Description :
Stable :

Result :
Miscible with water, benzene, chloroform, ethanol, 1,2-dichloroethane, ether, acetone, dioxane, tetrahydrofuran, pyridine; moderately sol in carbon tetrachloride
Test substance :
Propargyl alcohol, CASNO 107-19-7
Reliability : (2) valid with restrictions
Handbook data are assigned reliability of 2
09.12.2002 (25)

Solubility in : Water
Value : > 1000 g/l at 20 °C
pH value : = 7
concentration : 330 g/l at 20 °C
Temperature effects :
Examine different pol. :
pKa : at 25 °C

Description :
Stable :

Result : Miscible
Test substance : Propargyl alcohol, CASNO 107-19-7
Reliability : (4) not assignable
Study not available for review
09.12.2002 (8)

Solubility in : Organic Solvents
Value : at °C
pH value :
concentration : at °C
Temperature effects :
Examine different pol. :
pKa : at 25 °C
Description :
Stable :

Result : Miscible with water, benzene, chloroform, ethanol, 1,2-dichloroethane, ether, acetone, dioxane, tetrahydrofuran, pyridine; moderately sol in carbon tetrachloride
Test substance : Propargyl alcohol, CASNO 107-19-7
Reliability : (2) valid with restrictions
Handbook data are assigned reliability of 2
09.12.2002 (25)

Solubility in : Water
Value : = 1000 mg/l at 20 °C
pH value :
concentration : at °C
Temperature effects :
Examine different pol. :
pKa : at 25 °C
Description :
Stable :

Test substance :
Propargyl alcohol, CASNO 107-19-7
Reliability : (2) valid with restrictions
21.07.2003 (32)

3.1.1 PHOTODEGRADATION

Type	:	air
Light source	:	
Light spectrum	:	nm
Relative intensity	:	based on intensity of sunlight
INDIRECT PHOTOLYSIS		
Sensitizer	:	OH
Conc. of sensitizer	:	1500000
Rate constant	:	= .00000000001 cm³/(molecule*sec)
Degradation	:	= 50 % after 12.3 hour(s)
Deg. product	:	
Method	:	
Year	:	
GLP	:	no
Test substance	:	
Method	:	AOP v1.90 (EPIWIN) calculation
Remark	:	Based on the structure, it is also estimated that Propargyl alcohol vapor will react with atmospheric ozone but this reaction will be insignificant compared with the hydroxyl radical reaction rate. The estimated half life for reaction with ozone is 382 days usiing the EPA default ozone concentration and the APOWIN predicted reation rate constant.
Result	:	AOP Program (v1.90) Results: ========== SMILES : C#CCO CHEM : Propargyl Alcohol MOL FOR: C3 H4 O1 MOL WT : 56.06 -------- SUMMARY (AOP v1.90): HYDROXYL RADICALS -------- Hydrogen Abstraction = 3.2690 E-12 cm3/molecule-sec Reaction with N, S and -OH = 0.1400 E-12 cm3/molecule-sec Addition to Triple Bonds = 7.0000 E-12 cm3/molecule-sec Addition to Olefinic Bonds = 0.0000 E-12 cm3/molecule-sec Addition to Aromatic Rings = 0.0000 E-12 cm3/molecule-sec Addition to Fused Rings = 0.0000 E-12 cm3/molecule-sec OVERALL OH Rate Constant = 10.4090 E-12 cm3/molecule-sec HALF-LIFE = 1.028 Days (12-hr day; 1.5E6 OH/cm3) HALF-LIFE = 12.331 Hrs -- SUMMARY (AOP v1.90): OZONE REACTION ---------- OVERALL OZONE Rate Constant = 0.003000 E-17 cm3/molecule-sec HALF-LIFE = 382.000 Days (at 7E11 mol/cm3) Experimental Database: NO Structure Matches
Source	:	Toxicology and Regulatory Affairs Calculation, 2002
Test substance	:	Propargyl alcohol, CASNO 107-19-7
Reliability	:	(1) valid without restriction Calculated by an acceptable method.
Flag	:	Critical study for SIDS endpoint

31.12.2002 (16)

3.1.2 STABILITY IN WATER

Type	:	abiotic
t1/2 pH4	:	at °C
t1/2 pH7	:	at °C
t1/2 pH9	:	at °C
Degradation	:	< 50 % after 1 year at pH and °C
Deg. product	:	
Method	:	other: Estimation based on chemical principles
Year	:	2002
GLP	:	no
Test substance	:	

Method :

The stability of this material in water is estimated based on established chemical principles.

Result :

Both the alkyne and alcohol moieties are considered generally resistant to hydrolysis by Harris (J.C. Harris in Lyman W, Reehl, W and Rosenblat, D. Handbook of Chemical Property Estimation Methods. American Chemical Society, Washington D.C. 1990, page 7-6). This indicates a hydrolytic half-life of greater than one year.

There is no chemical interaction between the alcohol and the alkyne that would facilitate the reaction of this substance with water. Reaction with water occurs either by a unimolecular process (Sn1 mechanism) or a bimolecular process (Sn2 mechanism).

In the unimolecular process, the initial reaction is dissociation of the chemical into an anion and a cation that is capable of undergoing nucleophilic attach by water. In the case of Propargyl alcohol, the only dissociation reactions available only form anions on either the terminal carbon center or the oxygen center. Either is unlikely as the pKa for the alcohol is in the range of 14-18 and the pKa for the terminal alkyne is in the range of 25 (see Vollhardt, K. "Organic Chemistry" WH Freeman and Co, New York, 1987). Furthermore the parent compound form an anion and not a cation that cam be attached by water.

In the bimolecular process it is necessary for there to be an electrophilic center capable of undergoing attack by a nucleophile. The only electrophilic center is the carbon attached to the hydroxyl group. Attack there by hydroxyl anion leads only to hydroxyl exchange and no change chemical structure.

In summary, Propargyl alcohol is considered resistant to hydrolysis and will have an environmental hydrolytic half-life of greater than one year.

Test substance	:	Propargyl alcohol, CASNO 107-19-7 purity 97% (source: Aldrich Chemicals)
Reliability	:	(2) valid with restrictions Estimate based on acceptable chemical principles
Flag	:	Critical study for SIDS endpoint

14.12.2002 (17)

3.3.1 TRANSPORT BETWEEN ENVIRONMENTAL COMPARTMENTS

3.3.2 DISTRIBUTION

Media : air - biota - sediment(s) - soil - water
Method : Calculation according Mackay, Level III
Year : 2002

Method : Determined using the Level 3 EQC Model found in EPIWIN 3.05. Actual values were used for measured physicochemical parameters. The degredation times applied using the BIOWIN were concidered reasonable based on limited data and surrogate compounds.

Result :

Level III Fugacity Model (Full-Output):
==========

Chem Name : Propargyl Alcohol
Molecular Wt: 56.06
Henry's LC : 1.15e-006 atm-m3/mole (Henry database)
Vapor Press : 11.7 mm Hg (user-entered)
Log Kow : -0.35 (user-entered)
Soil Koc : 0.183 (calc by model)

	Concentration (percent)	Half-Life (hr)	Emissions (kg/hr)
Air	3.11	24.6	1000
Water	53.6	360	1000
Soil	43.2	360	1000
Sediment	0.0896	1.44e+003	0

	Fugacity (atm)	Reaction (kg/hr)	Advection (kg/hr)	Reaction (percent)	Advection (percent)
Air	1.13e-010	733	260	24.4	8.68
Water	4.59e-011	862	448	28.7	14.9
Soil	1.35e-009	696	0	23.2	0
Sediment	3.82e-011	0.36	0.015	0.012	0.000499

Persistence Time: 279 hr
Reaction Time: 365 hr
Advection Time: 1.18e+003 hr
Percent Reacted: 76.4
Percent Advected: 23.6

Half-Lives (hr), (based upon Biowin (Ultimate) and Aopwin):
Air: 24.61
Water: 360
Soil: 360
Sediment: 1440
Biowin estimate: 3.235 (weeks)

Advection Times (hr):
Air: 100
Water: 1000
Sediment: 5e+004

Source : Toxicology and Regulatory Affairs Calculation 2002
Test substance :

Propargyl alcohol, CASNO 107-19-7

Reliability : (1) valid without restriction
Calculated by an acceptable method using measured physicochemical parameters.

Flag : Critical study for SIDS endpoint

30.12.2002 (16)

3.5 BIODEGRADATION

Type : aerobic
Inoculum : activated sludge
Concentration : 100 mg/l related to Test substance
related to
Contact time : 28 day(s)
Degradation : = 95 (±) % after 28 day(s)
Result :
Deg. product :
Method :
Year :
GLP : no data
Test substance :

Method : MITI Test procedure is indicated as the protocol for all biodegradation data available on this web site. The details of the test conditions also follow the OECD 301C Modified MITI Test guideline.

Remark : A detailed protocol for the study was not available. It is stated on the web site that these studies were conducted using the MITI procedures so it is assummed that this used the MITI protocol.

Result : The material biodegraded essentially completely inder these test conditions.

Test condition : Conditions for this study are described as:

Concentration of test substance	100 mg/L
Concentration of activated sludge [suspended solid]	30 mg/L
Volume of test solution	300 mL
Incubation temperature	25 deg C
Incubation duration	28 days

Measurements:

At the end of the 28-day incucation period the oxygen uptake, the total organic carbon and the ammount of unchanges test material were determined in triplicate.

The findings, expressed as percentage biodegradation are:

BOD	93, 114, 78	avg 95%
TOC	97, 98, 97	avg 97%
HPLC	100, 100, 100	avg 100%

Test substance :
Propargyl alcohol, CASNO 107-19-7
Reliability : (2) valid with restrictions
Flag : Critical study for SIDS endpoint
21.07.2003 (13)

Type : aerobic
Inoculum :
Contact time : 20 day(s)
Degradation : = 61 (±) % after 20 day(s)
Result :
Kinetic of testsubst. : 5 day(s) = 0 %
10 day(s) = 39 %
20 day(s) = 61 %
%
%

Method : The available report only describes the results of a BOD test.
Remark :
This result is supported by the BIOWIN v4.00 modeling results that predict rapid biodegredation.

Output summary:

BIOWIN (v4.00) Program Results:
==========
SMILES : C#CCO
CHEM : Propargyl Alcohol
MOL FOR: C3 H4 O1
MOL WT : 56.06

------ BIOWIN v4.00 Results ----------

Linear Model Prediction : Biodegrades Fast
Non-Linear Model Prediction: Biodegrades Fast
Ultimate Biodegradation Timeframe: Weeks
Primary Biodegradation Timeframe: Days
MITI Linear Model Prediction : Biodegrades Fast
MITI Non-Linear Model Prediction: Biodegrades Fast

Calculated by Toxicology and Regulatory Affairs 2002. Summary output only shown.

Result :
BOD 5 = 0
BOD10 = 0.73
BOD20 = 1.15

COD = 1.87
THOD = 2.0

In this case the BOD20 is 61% of the COD indicating that effective biodegredation is taking place. This conclusion is also supported by the kinetics.

Test substance :
Propargyl alcohol, CASNO 107-19-7
Reliability : (2) valid with restrictions
Flag :

31.12.2002 (28)

4.1 ACUTE/PROLONGED TOXICITY TO FISH

Type	:	flow through
Species	:	Pimephales promelas (Fish, fresh water)
Exposure period	:	96 hour(s)
Unit	:	mg/l
LC50	:	= 1.53 measured/nominal
Limit test	:	no
Analytical monitoring	:	yes
Method	:	other: ASTM
Year	:	1980
GLP	:	no data
Test substance	:	
Method	:	Exposure was accomplished using a continuous-flow dilutor. Twenty fathead minnows, 29 to 33 days old, were placed in each 2 liter tank. The flow rate was 25 ml/min using Lake Superior water which had been filtered and warmed. Fish were not fed during the esposure period. Analysis of concentration was conducted by gas chromatography at 0, 24, 48, 72 and 96 hours.
Remark	:	This determination was part of a mechanistic study of several acetylenic alcohols conducted at EPA's Duluth Laboratory.
Result	:	The 96-hour LC50 for Pimephales promelas (fathead minnow) was determined to be 1.53 mg/l with a confidence limit of 1.49-1.56 mg/l Loss of equilibrium was also reported as an effect.
Test condition	:	Flow-through bioassay with measured concentrations, 25.7 deg C, dissolved oxygen 6.8 mg/l, hardness 43.4 mg/l as calcium carbonate, alkalinity 40.8 mg/l calcium carbonate, and pH 7.72
Test substance	:	Propargyl alcohol, CASNO 107-19-7, purity >95%
Reliability	:	(1) valid without restriction Acceptable Publication, part of major study of similar compounds.

30.12.2002 (18) (30)

Type	:	flow through
Species	:	Pimephales promelas (Fish, fresh water)
Exposure period	:	96 hour(s)
Unit	:	mg/l
LC50	:	= 1.44 measured/nominal
Limit test	:	no
Analytical monitoring	:	yes
Method	:	other: ASTM
Year	:	
GLP	:	no data
Test substance	:	
Method	:	Flow-through bioassay with measured concentrations, 24.7 deg C, dissolved oxygen 6.9 mg/l, hardness 42.8 mg/l calcium carbonate, alkalinity 40.6 mg/l calcium carbonate, and pH 7.7.
Result	:	The 96-hour LC50 for Pimephales promelas (fathead minnow) was

determined to be 1.44 mg/l with a confidence limit of 1.25-1.67 mg/l

Loss of equilibrium was also reported as an effect.

Test substance :

Propargyl alcohol, CASNO 107-19-7, purity >95%

Reliability : (2) valid with restrictions
Acceptable Publication

30.12.2002 (18)

Type : static
Species : Leuciscus idus (Fish, fresh water)
Exposure period : 96 hour(s)
Unit : mg/l
LC0 : = 3.16
LC50 : = 4.6
LC100 : = 6.81
Limit test : no
Analytical monitoring : no
Method : other: Bestimmung der Wirkung von Wasserinhaltsstoffen auf Fische, DIN 38412, Teil 15
Year :
GLP : no
Test substance :

Method : Followed DIN guideline: Bestimmung der Wirkung von Wasserinhaltsstoffen auf Fische, DIN 38412, Teil 15

Result :

The number of fish dead at each observation is shown in the table:

	TIME (hours)			
Conc	24	48	72	96
0.00	0	0	0	0
1.00	0	0	0	0
1.47	0	0	0	0
2.15	0	0	0	0
3.16	0	0	0	0
4.64	0	0	0	4
6.81	0	0	10	10
10.0	0	5	10	10

The pH was determined at each observation and only varied from 7.4 to 7.7
Oxygen levels were in a range of 7.0 to 8.6 at all observations and concentrations.

Test condition : Dilution water was prepared by reconstituting demineralized tapwater with 344 mg/L CaSO4-2 H2O, 124 mg/L MgSO4-7 H2O, 70 Mg/L Sodium bicarbonate and 3 mg/L potassium chloride. Total hardness was 2.6 mmol/L, alkalinity 2.2 mmol/L, oxygen > mg/L and pH 8+-0.1. The test-temperature was 20 +- 1deg C.

Containers were glass aquaria 30x22x24 cm containing 10L water for 10 fish. Details of the dosing-solution preparation were not given in the report. It is assumed that is was diluted in water since it is water miscible.

Ten fish (mean body weight 2.8 grams) per concentration were exposed to the following concentrations of test material. 0.00, 1.00, 1.47, 2.15, 3.16,

4.64, 6.81, 10.0 mg/L for 96 hours. Fish were examined at 24, 48, 72 and 96 hours.

Calculation of the LC50 was conducted by probit analysis after Finney (Probit Analysis, Cambridge University Press 3ed 1971)

Test substance :
Propargyl alcohol, CASNO 107-19-7

Reliability : (1) valid without restriction
Guideline study with good documentation

30.12.2002 (5)

Type : static
Species : Leuciscus idus melanotus (Fish, fresh water)
Exposure period : 48 hour(s)
Unit : mg/l
LC0 : = .5
LC50 : = 1.9
LC100 : = 4.8
Limit test : no
Analytical monitoring : no data
Method : other: Bestimmung der Wirkung von Wasserinhaltsstoffen auf Fische, DIN 38412, Teil 15, Vorabdruck 1976
Year :
GLP :
Test substance :

Method : Followed DIN guideline: Bestimmung der Wirkung von Wasserinhaltsstoffen auf Fische, DIN 38412, Teil 15

Test substance :
Propargyl alcohol, CASNO 107-19-7

Reliability : (2) valid with restrictions
Secondary source limits reliability to 2

30.12.2002 (23)

4.2 ACUTE TOXICITY TO AQUATIC INVERTEBRATES

Type : static
Species : Daphnia magna (Crustacea)
Exposure period : 24 hour(s)
Unit : mg/l
EC0 : = 24
EC50 : = 32
EC100 : = 42
Limit Test : no
Analytical monitoring : no

Method : The dilution water was reconstituted freshwater prepared by dissolving individual salts in deionized water as stocks and diluting these into deionized water. The final concentration of salts in the dilution water was:

CaCl2-2 H2O	294 mg/L
MgSO4-7 H2O	123 mg/L
NaHCO3	65 mg/L
KCl	5.75 mg/L

The pH was 8 +- 0.2 and the water was bubbled with air to saturate it with

oxygen prior to starting the exposure.

Test containers were 50 ml beakers containing 20 ml water. Oxygen and pH levels were determined at the beginning and end of the 24-hour incubation time. The beakers were not sealed but were covered with filter paper and placed in an incubator at 20 deg C for the 24 hour exposure period.

Twenty daphnids (ten per container) were tested per group. The concentrations tested are not specified for the test materials in this publication (there are a large number) but it is noted that the dilution factor was initially 1:2 but if the result did not yield an EC0 and an EC100 that could be used to graphically determine the EC50, closer dilution factors were used. No analytical data on the actual concentrations are provided. EC50 values were determined graphically from the actual EC0 and EC100.

Remark :

The data indicate a rather steep dose response relation for the test material. This increases the accuracy for the EC50 determination. The lack of analytical data for this somewhat volatile compound is a confounder; however, it is less important as the exposure time was only 24 hours.

Result :

The EC50 graphically determined for propargyl alcohol was 32 mg/L with an EC0 of 24 mg/L and an EC100 of 42 mg/L.

Test substance :

Propargyl alcohol, CASNO 107-19-7

Reliability : (2) valid with restrictions
Published article with good detail by reliable investigators.

Flag : Critical study for SIDS endpoint

30.12.2002 (10)

Type : static
Species : Daphnia magna (Crustacea)
Exposure period : 24 hour(s)
Unit : mg/l
EC0 : = 6.3
EC50 : = 11
EC100 : = 25
Limit Test : no
Analytical monitoring : no
Method :
Year :
GLP : no
Test substance :

Method : The dilution water was chlorine-free tap water with a hardness of 16 deg H, a pH of 7.6 to 7.8 that was saturated with oxygen by bubbling with air.

Test containers were 50 ml beakers containing 20 ml water. Oxygen levels were determined at the beginning and end of the 24-hour incubation time. The beakers were covered with filter paper and placed in an incubator at 20-22 deg C for the 24-hour exposure period. Lighting was ambient from the laboratory.

Thirty daphnids, less than 24 hours old, (ten per container) were tested per dose-group. The concentrations tested are not specified for the test materials in this publication (there are a large number) but it is noted that

the dilution factor was initially 1:2 but if the result did not yield an EC0 and an EC100 with enough separation (three steps) that could be used to graphically determine the EC50, closer dilution factors (1.4 and 1.1) were used. No analytical data on the actual concentrations are provided. EC50 values were determined graphically from the actual EC0 and EC100.

Remark :

The data indicate a rather steep dose response relation for the test material. This increases the accuracy for the EC50 determination. The lack of analytical data for this somewhat volatile compound is a confounder; however, it is less important as the exposure time was only 24 hours.

This study states a lower LC50 than the latter study by the same investigators. The conditions were similar except this study used tap water for the investigations and the later study use reconstituted fresh water in an attempt to standardize the conditions and improve repeatability.

Result :

The 24-hour EC50 graphically determined for propargyl alcohol was 11 mg/L with an EC0 of 6.3 mg/L and an EC100 of 25 mg/L.

Test substance :

Propargyl alcohol, CASNO 107-19-7

Reliability : (2) valid with restrictions
Published article with good detail by reliable investigators.

30.12.2002 (9)

4.3 TOXICITY TO AQUATIC PLANTS E.G. ALGAE

Species : Scenedesmus quadricauda (Algae)
Endpoint : other: cell density
Exposure period : 8 day(s)
Unit : mg/l
EC03 : = 18
Limit test : no
Analytical monitoring : no

Method : Duplicate flasks containing 40 ml serially diluted test substance at a 1:1 ratio were inoculated with 5 ml concentrated (10X) media and 5 ml of a standardized concentration of algae. Flasks were incubated for 8 days at 27 deg under fluorescent lamps with shaking. After 8 days, relative concentration of cells was estimated by measuring the absorption and scattering of light at 578 nm from a mercury lamp. The measurement was conducted with a 10 mm light path cell after mixing the suspension to assure homogeneity.

The cell density was plotted graphically using semilog paper and the concentration that corresponded to a 3% reduction in cell density was determined and referred to as the "Toxiche Grenzkonzentration" or TGK. This translates into toxic threshold concentration in English. In the referenced report the TGK for about 200 substances was reported along with a TGK value for Pseudomonas putida. Because of the large volume of data, individual data for cell densities were not provided.

Remark :

This study has an impressive ammount of information and appears to have been well-conducted. Analytical verification of concentrations is missing and this could be a factor for materials that lack water stability or are volatile. The high water solubility and relaively low volatility (Henry's Law

constant) for Propargyl alcohol and its stability in water suggest that this test produced a reasonable estimate of the toxicity of the test material to green algae.

Result :

The toxic threshold concentration for 8-day growth of Scenedesmus quadricauda was found to be 18 mg/L. The toxic threshold concentartion for Pseudomonas putida was reported as 150mg/L

Test substance :

Propargyl alcohol, CASNO 107-19-7

Reliability : (2) valid with restrictions
Acceptable Publication, part of major study of similar compounds.

Flag : Critical study for SIDS endpoint
30.12.2002 (11)

Species : other algae:Generic green for modeling
Endpoint : other: growth inhibation
Exposure period : 96 hour(s)
Unit : mg/l
EC50 (CLOPG) : = 17.7
CE50 (CLOPG) : = 117
Method : other: ECOSAR model
Year :
GLP :
Test substance :

Method : This estimate of the potential of Propargyl alcohol was made using the U.S.EPA-developed ECOSAR software. This software utilizes two different SAR equations to estimate the 96-hour growth inhibition of green algae. The first (SRC) was derived using the SRC software to estimate the Kow of the materials in the "training set" and the second used the CLOGP methodology. As this material has an experimentally determined Kow, it is preferred to use the true value in the estimate; thus there is no way to distinguish a preference for one equation of the other without additional information.

The SAR equations and limitations are:

Log GA 96-h EC50 (mmoles/L) = -0.687 - 0.533 log Kow (using ClogP)
where n2, R^2=1.0, log Kow<6.4, MW<1000

Log GA 96-h EC50 (mmoles/L) = 0.091 - 0.655 log Kow (using SRC Kowwin)
where n2, R^2=1.0, log Kow<6.4, MW<1000

These equations were used to make the estimate with the measured log Kow of -0.35 using ECOSAR version 0.99f

Result :

Full output of the ECOSAR program

ECOSAR Program (v0.99f) Results:
==========
SMILES : C#CCO
CHEM : Propargyl Alcohol
CAS Num:
ChemID1:
ChemID2:
ChemID3:

MOL FOR: C3 H4 O1
MOL WT : 56.06
Log Kow: -0.35 (User entered)
Melt Pt: -52.00 deg C
Wat Sol: 1E+006 mg/L (measured)

ECOSAR v0.99f Class(es) Found

Propargyl Alcohols
Predicted

ECOSAR Class	Organism	Duration	End Pt	mg/L (ppm)
Neutral Organic SAR (Baseline Toxicity)	Fish	14-day	LC50	8385.703
Propargyl Alcohols	Fish [CLOGP]	96-hr	LC50	4.669
Propargyl Alcohols	Fish [SRC]	96-hr	LC50	8.530
Propargyl Alcohols	Daphnid [CLOGP]	48-hr	LC50	4.630
Propargyl Alcohols	Daphnid [SRC]	48-hr	LC50	11.400
Propargyl Alcohols	Green Algae[CLOGP]	96-hr	EC50	17.711**
Propargyl Alcohols	Green Algae[SRC]	96-hr	EC50	117.203**
Propargyl Alcohols	Fish [CLOGP]	ChV		0.186
Propargyl Alcohols	Fish [SRC]	ChV		0.354
Propargyl Alcohols	Daphnid [CLOGP]	ChV		0.228
Propargyl Alcohols	Daphnid [SRC]	ChV		0.947
Propargyl Alcohols	Green Algae [CLOGP]	ChV		9.743
Propargyl Alcohols	Green Algae [SRC]	ChV		63.189

Test substance :

Propargyl alcohol, CASNO 107-19-7

Reliability : (2) valid with restrictions

Calculated by an acceptable method using measured physicochemical parameters.

21.07.2003 (12)

4.4 TOXICITY TO MICROORGANISMS E.G. BACTERIA

5.1.1 ACUTE ORAL TOXICITY

Type	:	LD50
Value	:	= 55 - 110 mg/kg bw
Species	:	rat
Strain	:	Sprague-Dawley
Sex	:	male/female
Number of animals	:	120
Vehicle	:	water
Doses	:	
Method	:	
Year	:	
GLP	:	no data
Test substance	:	

Method :

Test substance in dosages ranging from 0 to 400 mg/kg in 0.5 ml aqueous solutions were administered by gavage to young adult male and females Sprague-Dawley weighing from 100 to 200 g. The treated animals were held 48 hours at 24°C with food and water add libitum, after which the dead rats were counted. When treated, the females were 63 days old and the males were 46 days old. Propargyl alcohol was diluted with deionized water so that 0.5 ml contained the desired dosage. Animals were caged separately after gavage.

Four experiments were conducted to establish the LD50 for males and for females. Experiment I had 18 male and 18 female rats (two at each treatment level) treated at 0, 0.025, 0.050, 0.075, 0.100, 1.0, 10.0, 40.0, or 400 mg/kg and all rats survived except those treated at 400 mg/kg. In experiment II, 14 male and 14 female rats (two at each treatment level) were treated at 0, 100, 200, 250, 300, 350, or 400 mg/kg and all rats died except the controls. In experiment III there were 16 male and 16 female rats (two at each treatment level) treated at 0, 40, 50, 60, 70, 80, 90, or 100 mg/kg and all the female rats died at 60 mg/kg or higher and all remained alive from 0 through 50 mg/kg. All the male rats remained alive at all treatment levels. Experiment IV had 14 male rats (two at each treatment levels) treated at 0, 40, 80, 100, 110, 120, 150 or 200 mg/kg and all rats survived between 0 and 80, 1 died and 1 remained alive at 100 and 110 and all died at 120 mg/kg or higher doses.

The oral LD50 was calculated by the probit method (Finney, 1971).

Result :

The oral LD50 was calculated by the probit method (Finney) as 110 (100-120) mg/kg for male rats and 55 (50-60) mg/kg for female rats.

Experimental animals that died had moderate multifocal medullary hemorrhage in the thymus, interstitial hemorrhage with atrophy of the surrounding acinar cells.

Test substance :

Propargyl alcohol, CASNO 107-19-7 purity 97% (source: Aldrich Chemicals)

Conclusion :

The oral LD50 was 110 (100-120) mg/kg for male rats and 55 (50-60) mg/kg for female rate.

Reliability : (1) valid without restriction
Although no guideline was followed, the stated purpose was to clarify the

oral LD50 of the test substance. The publication gives good detail and the study was conducted by a scientifically defensible method.

Flag : Critical study for SIDS endpoint
30.12.2002 (2)

Type : LD50
Value : = 56 mg/kg bw
Species : rat
Strain : no data
Sex : no data
Number of animals :
Vehicle : water
Doses :

Method : Study was conducted in accord with the standard laboratory procedure of that time as part of acute toxicity screen. The procedure is not specified except that the vehicle was distilled water and the test substance was adminisnterd as a 1% solution, the post-dosing observation period was 7 days, and the LD50 was calculated by the procedure of Litchfiels-Wilcoxon. Clinical signs were recorded and a necropsy was conducted but it is not specified if it was on all rats or only decedents.

Remark :
This result is in good agreement with other studies.

Result :
An oral LD50 of 56 mg/kg-bw was found with a confidence interval of 46.5 to 67.5. The strain, sex, age and weights of the test anmials are not specified.

Clinincal signs were reported as hyperactivity, accelerated respiration, prone position.

Necropsy findings were: Liver swelling in some individual rats, blood in intestine contents, bleeding in the lung.

Test substance :
Propargyl alcohol, CASNO 107-19-7

Reliability : (2) valid with restrictions
Although some important details are missing, the original laboratory report was available and it provides sufficient detail to ascertain that the study was conducted using a scientifically defensible procedure.
30.12.2002 (4)

Type : LD50
Value : = 54 - 93 ml/kg bw
Species : rat
Strain : Sprague-Dawley
Sex : male/female
Number of animals :
Vehicle :
Doses :
Method :
Year :
GLP : no data
Test substance :

Method : The method of Smyth et al. (Rangefinding Toxicity data: List VI. Amer. Ind. Hyg. Ass. J. 23:95-107, 1962) was used to conduct this study. I the case of this material, enough data were collected to use the probit method

(Finney, 1971) to calculate the LD50 values for each sex. Rats were Sprague-Dawley strain 200-300 grams.

Result :

Individual data are not provided in this report on the toxicity of about 100 materials. The data are in a table and for this test material the following oral data are given: a LD50 (males) of 93 mg/kg with a confidence interval of 58-150mg/kg and a LD50 (females) of 54 mg/kg with a confidence interval of 37-78.

Test substance :

Propargyl alcohol, CASNO 107-19-7

Conclusion :

The following LD50 were found under these conditions:

LD50 (males) of 93 mg/kg with a confidence interval of 58-150 mg/kg

LD50 (females) of 54 mg/kg with a confidence interval of 37-78 mg/kg

Reliability : (2) valid with restrictions
Published article in peer-reviewed journal.

31.12.2002 (31)

5.1.2 ACUTE INHALATION TOXICITY

Type	:	LC50
Value	:	= 1040 - 1200 ppm
Species	:	rat
Strain	:	Sprague-Dawley
Sex	:	male/female
Number of animals	:	
Vehicle	:	
Doses	:	
Exposure time	:	1 hour(s)
Method	:	
Year	:	
GLP	:	no data
Test substance	:	

Method : Inhalation experiments were performed in bells jars or large desiccators using 5 rats per exposure level. One-hour LC50 were determined by the method of Thompson (1947, Bact. Rev. 11:115-145) and by Weil (1952, Biometrics 8:249-63). The chamber contaminant concentration was measured such that it gave a relative SD of 5% or less. In the case of this test material, there was enough test data to calculate the LC50 values using the probit procedure of Finney. Rats were Sprague-Dawley strain 200-300 grams.

Result :

Individual data are not provided in this report on the toxicity of about 100 materials. Data contained in the table for this test material regarding inhalation toxicity are: The 1-hour LC50 (males) is 1200 ppm with a confidence interval of 1180-1220ppm and the 1-hour LC50 (females) is 1040 ppm with a confidence interval of 970-1120 ppm.

Test substance :

Propargyl alcohol, CASNO 107-19-7

Conclusion :

The following 1-hour LC50 values were found under these conditions:

1-hour LC50 (rat, male) = 1,200 (1180-1220) ppm

1-hour LC50 (rat, female) = 1,040 (970-1120) ppm.

Reliability : (2) valid with restrictions

Published article in peer-reviewed journal.

30.12.2002 (31)

Type : other: limit test, 1-hour exposure
Value :
Species : rat
Strain : Sprague-Dawley
Sex : male/female
Number of animals : 10
Vehicle :
Doses : 1490 ppm
Exposure time : 60 minute(s)
Method :
Year :
GLP : yes
Test substance :

Method : Test animals were Sprague-Dawley (Crl:CD®BR) rats received from Charles River Laboratories, Inc., Raleigh, North Carolina. Animals were acclimated to laboratory conditions for one week prior to treatment.

Exposure of the test animals was conducted in a 100 liter plexiglass chamber. The chamber was operated in a dynamic mode with total airflow through the chamber of 19.2 liters per minute (lpm) as measured using a calibrated flowmeter.

The test material was used as received and was generated as a vapor in the breathing zone of the animals using tandem bubblers. House air was metered through a valve, a 0-30 lpm Dwyer flowmeter, and a backpressure gauge to the 500 ml fritted disk gas wash bottle via I.D. Tygon tubing. Additional Tygon tubing connected the first 500 ml fritted disk gas wash bottle with the second 500 ml fritted disk gas wash bottle. Both bubblers were filled to approximately 20-25% capacity with test article. Additional Tygon tubing connected the second 500 ml fritted disk gas wash bottle to a 500 ml 3-necked flask containing glass wool. The flask was connected to the 100 liter exposure chamber with a glass adapter and stopper. Dilution air was metered to the 3-necked flask through a valve, a 0-20 lpm Dwyer flowmeter, and a backpressure gauge via Tygon tubing.

After 60 minutes of exposure, the test material generation system was turned off and compressed air was passed through the exposure chamber at the same rate for an additional half-hour to clear residual propargyl alcohol vapor. At 30 minutes post-exposure, the chamber was opened and the animals were removed.

Animals were observed every 15 minutes during the exposure. Physical examinations were performed prior to exposure, at removal from the chamber 60 minutes after the end of exposure, and once daily thereafter. Animals were examined at least twice daily for mortality and moribundity. Animals were weighed just prior to exposure and at death. All animals found dead were subjected to a complete postmortem examination. No tissues were saved

Result :

The mean (time weighted average) exposure level of propargyl alcohol was

determined by MIRAN assay to be 1490 ± 159.8 ppm. Particle size distribution measurements revealed the test atmosphere contained only a vapor. Clinical signs associated with treatment included hunched posture, rough hair coat, increased secretory responses, low body temperature, languid behavior, prostration, and death. All animals died by Test Day 3. Gross postmortem evaluations revealed numerous findings, all of which were ascribed to post-mortem changes. There were no lesions which were obviously related to treatment.

Test substance :

Propargyl alcohol, CASNO 107-19-7

Reliability : (1) valid without restriction
Guideline-like study under GLPs with good documentation.

30.12.2002 (20)

5.1.3 ACUTE DERMAL TOXICITY

Type : LD50
Value : = 88 mg/kg bw
Species : rabbit
Strain : New Zealand white
Sex : female
Number of animals :
Vehicle :
Doses :
Method : other: Symth (1962)
Year :
GLP :
Test substance :

Method : The method of Smyth et al. (Rangefinding Toxicity data: List VI. Amer. Ind. Hyg. Ass. J. 23:95-107, 1962) was used to conduct this study except that three female rabbits were used per dose and the dosed were kept in place by 8-ply gauze patches under a rubber latex film. The LD50 was determined using the moving average method as described by Thompson (1947, Bact. Rev. 11:115-145) and by Weil (1952, Biometrics 8:249-63).

Rabbits were females 3-4 kg

Result :

Individual data are not provided in this report of the toxicity of about 100 materials. The data are in a table and for this test material; a dermal LD50 of 88 mg/kg body weight is reported

Test substance :

Propargyl alcohol, CASNO 107-19-7

Reliability : (2) valid with restrictions
Published article in peer-reviewed journal.

Flag : Critical study for SIDS endpoint
30.12.2002

Type : LDLo
Value : ca. 15 mg/kg bw
Species : rabbit
Strain :
Sex :
Number of animals :
Vehicle :
Doses :

Method	:	
Year	:	
GLP	:	no
Test substance	:	

Method : Few details are given in this short report. Material was administered as a 1.58% solution in Dowanol 50B and remained on the skin of rabbits for 24 hours. There were two rabbits per test group and three test groups at 7.95, 15.8 and 31.6 mg/kg-bw. Mortality in the test groups was 0/2, 1/2 and 1/2, respectively. Observation time not reported.

Clinical signs were reported at the two higher doses and consisted of slight diarrhea, hyperemia and moderate edema.

Remark :

This study is usefull in confirming the high-degree of dermal toxicity for this material and demonstrating that the dermal toxicity is probably enhanced by solvents that increase dermal absorption. The Dermal LD50, using water as vehicle, for comparison is 88 mg/kg-bw.

Dowanol-50 is listed in the literature as Dipropyleneglycol monomethyl ether.

Test substance :

Propargyl alcohol, CASNO 107-19-7

Conclusion :

The LDlo for this material as a Dowanol-50 solution in the rabbit is 15 mg/kg-bw.

Reliability : (2) valid with restrictions
Although details are lacking, original report was available.

30.12.2002 (26)

5.1.4 ACUTE TOXICITY, OTHER ROUTES

5.4 REPEATED DOSE TOXICITY

Type	:	Sub-chronic
Species	:	rat
Sex	:	male/female
Strain	:	Fischer 344
Route of admin.	:	inhalation
Exposure period	:	90-days
Frequency of treatm.	:	daily, 5 days per week
Post exposure period	:	
Doses	:	0, 2, 4, 8, 16 and 32 ppm
Control group	:	
NOAEL	:	= 16 ppm
LOAEL	:	= 32 ppm
Method	:	other: NTP SOW
Year	:	
GLP	:	yes
Test substance	:	

Method : Male and female F344 rats (20/sex/group; 10 allocated to the core study and 10 allocated for clinical pathology testing) were exposed by whole-body inhalation to target concentrations of 0, 4, 8, 16, 32, or 64 ppm

propargyl alcohol for up to 13 weeks. Exposure was 5 days per week; however, the number of hours exposure per day is not available in the abstract. The NTP statement of work specifies conducting studies at a 6-hour/day exposure. The actual protocol is archived at the NTP and, if necessary, could be obtained.

This was conducted by developing a system to generate, deliver, and monitor concentrations of teat material vapor for inhalation exposures in whole body exposure chambers. During the study, measurements were made to validate the performance of the exposure generation and monitoring system. The test atmosphere concentrations and environmental conditions during the study were within the protocol-specified range for daily means for all exposures. In addition, studies were conducted demonstrating that propargyl alcohol was stable under the generation and exposure conditions and the uniformity in the exposure chambers was acceptable.

Result :

Results of the study in rats are summarized below

EFFECTS MALE RATS
Mortality and 13-week body weights

	Exposure Concentration (ppm)					
	0	4	8	16	32	64
Mortality	0/10	0/10	0/10	0/10	0/10	0/10
Body wt [g]	334.6	353.9	333.3	336.5	332.0	327.7
± SD	±13.6	± 22.1	±28.4	±29.0	±8.4	±23.2
%Difference	NA	+5.8	-0.4	+0.6	-0.8	-2.1

Necropsy Findings	Exposure Conc (ppm)					
	0	4	8	16	32	64
Gross observations	NS	NS	NS	NS	NS	NS
Increased kidney/body wt	NA	NS	NS	NS	NS	++
Increased liver weight	NA	NS	NS	NS	NS	++
Increased liver/body wt	NA	NS	NS	NS	++	++

Clinical Pathology Findings	Exposure Conc (ppm)					
	0	4	8	16	32	64
Day 3: Increased BUN	NA	NS	NS	NS	++	++
Day 23: Increased BUN	NA	NS	NS	NS	+	++
Day 23: Decreased cholin'ase	NA	NS	NS	NS	NS	+
SAC: Decreased cholinest'ase	NA	NS	NS	NS	+	++

Histopathology	Exposure Conc (ppm)					
	0	4	8	16	32	64
Necrosis, olfactory epithelium, nose	0/10	0/10	0/10	0/10	2/10	5/10
Hyperplasia, respirat epithe'm nose	2/10	6/10	2/10	4/10	8/10	10/10
Squamous metaplasia respiratory epit'm nose	0/10	0/10	0/10	0/10	0/10	3/10

+ = Sig at < 0.05
++ = Sig at < 0.01

EFFECTS FEMALE RATS
Mortality and 13-week body weights

	Exposure Concentration (ppm)					
	0	4	8	16	32	64
Mortality	0/10	0/10	0/10	0/10	0/10	0/10
Body wt [g]	195.9	203.6	190.2	190.7	197.0	190.0
± SD	±14.1	±18.4	±12.7	±12.1	±10.3	±9.5
%Difference	NA	+3.9	-2.9	-2.7	+0.6	-3.0

Necropsy Findings	Exposure Conc (ppm)					
	0	4	8	16	32	64
Gross observations	NS	NS	NS	NS	NS	NS
Increased kidney/body wt	NA	NS	NS	NS	NS	++
Increased liver/body wt	NA	NS	NS	NS	NS	++

Clinical Pathology Findings	Exposure Conc (ppm)					
	0	4	8	16	32	64
Day 3: Increased BUN	NA	NS	NS	NS	++	++
Day 3: Decreased cholin'ase	NA	NS	NS	NS	++	+
Day 23: Decreased cholin'ase	NA	NS	NS	+	++	++
SAC: Decreased cholinest'ase	NA	NS	+	+	++	++

Histopathology	Exposure Conc (ppm)					
	0	4	8	16	32	64
Necrosis, olfactory epithelium, nose	0/10	0/10	0/10	0/10	3/10	5/10
Hyperplasia, respirat epithe'm nose	0/10	2/10	2/10	2/10	10/10	10/10
Squamous metaplasia respiratory epit'm nose	0/10	0/10	0/10	0/10	0/10	8/10
Necrosis respiratory epit'm nose	0/10	0/10	0/10	0/10	0/10	2/10

+ = Sig at < 0.05
++ = Sig at < 0.01

Exposure did not result in any significant in-life toxic effects, except for lesions in the nasal cavity and depressed serum cholinesterase levels in both sexes. Survi val was 100% for all groups and there was no significant effect of exposure on body weight or weight gain in males or females. Clinical signs were unremarkable; there were no changes in hematology parameters. At exposures of = 32 and = 8 ppm for males and females, respectively; serum cholinesterase levels were depressed initially and remained depressed until terminal sacrifice. This was particularly manifest in females, increasing progressively with increasing exposure concentrations and involving lower concentrations as exposures progressed.
Gross lesions related to treatment were not observed. Relative kidney and liver weights were significantly increased at 64 ppm in rats of each sex. Adverse effects on the kidney were indicated by elevated BUN levels at 32 and 64 ppm early in the study. Relative lung weights were elevated in males exposed to 64 ppm. Significant exposure-related histopathology findings were limited to the nose in males and females. A no-effect level could not be determined because of hyperplasia of the respiratory

epithelium in both sexes. Metaplasia in the nose occurred in male and female rats at the high concentration. Necrosis of the olfactory epithelium was observed in males and females exposed at 32 or 64 ppm, while necrosis of the respiratory epithelium was limited to the 64-ppm females. A no-effect level based on these observations (necrosis and metaplasia) was 16 ppm.

Test substance :

Propargyl alcohol, CASNO 107-19-7, purity >99.6%

Reliability : (1) valid without restriction
NTP Guideline study under GLP with full QA reviews

Flag : Critical study for SIDS endpoint

24.07.2003 (24)

Type	:	Sub-chronic
Species	:	rat
Sex	:	
Strain	:	Wistar
Route of admin.	:	inhalation
Exposure period	:	90-days
Frequency of treatm.	:	daily, except weekends
Post exposure period	:	none
Doses	:	1.1, 5.1 and 24.6 ppm
Control group	:	yes, concurrent vehicle
NOAEL	:	= 5.1 ppm
LOAEL	:	= 24.6 ppm
Method	:	
Year	:	
GLP	:	yes
Test substance	:	

Method : Propargyl alcohol vapor was tested for its inhalation toxicity in Wistar rats. 10 female and 10 male rats per group were exposed to target concentrations of 25 ppm, 5 ppm and 1 ppm on 6 hours/day, 5 days/week for a period of 90 days (65 exposures). A control group of 10 female and 10 male rats inhaled clean air under similar exposure conditions. Body weights of the animals were determined weekly during the exposure period. Clinical signs and findings were recorded on exposure days. Mortality was checked daily.

Remark :

As this is only a supporting study, details are kept to a minimum.

Result :

Mean measured vapor concentrations were very close to target at 1.1, 11.4 and 24.6 ppm. No mortality was recorded and there were not any treatment-related clinical signs reported. Body-weight gains were statistically unaffected at the end of the study; however, male rats showed statistically significant reduction in body weight-gain during the first 2 weeks of exposure.

In females of the high-dose group, absolute and relative kidney weights were increased and cholinesterase activity was decreased.

Complete histopathologic examination found no treatment related organ effects.

Clinical chemistry and hematology results were unremarkable.

Test substance :

Propargyl alcohol, CASNO 107-19-7, purity 99.4%

Reliability	:	(1) valid without restriction Guideline-like study under GLPs with good documentation.
31.12.2002		(3)
Type	:	Sub-chronic
Species	:	rat
Sex	:	male/female
Strain	:	Sprague-Dawley
Route of admin.	:	gavage
Exposure period	:	13 Weeks
Frequency of treatm.	:	daily
Post exposure period	:	none
Doses	:	5, 15, 50 mg/kg-day
Control group	:	yes, concurrent vehicle
NOAEL	:	= 5 mg/kg bw
LOAEL	:	= 15 mg/kg bw
Method	:	
Year	:	
GLP	:	yes
Test substance	:	

Method :

Four groups of rats (30/sex/group) were dosed orally once daily with 0, 5, 15, or 50 mg/kg of propargyl alcohol. Animals were Crl:CD (SD)BR rats obtained from the Portage Michigan facility of Charles River Laboratories and were 45-50 days old at the start of treatment. The first ten rats of each group were scheduled for the interim sacrifice after dosing for 4-weeks. The remaining 20 rats in each group were scheduled for the final sacrifice after dosing for 91 or 92 days. A fifth group of 10 males and 10 females were sacrificed before initiation of dosing for baseline clinical pathology data.

Samples of gavage solutions were tested at intervals during the study to assure the proper quantity of test material was administered.

Body weights and food consumption were recorded weekly. Observations for mortality and/or overt signs of toxicity were made four times daily. Ophthalmologic examinations were performed during the pretreatment period and again during week 13. Blood for clinical pathology evaluation was collected from all surviving rats scheduled for the interim sacrifice on week-4, and from the first ten surviving rats/sex/group (except high-dose males) at the final sacrifice. The first ten rats of each sex from each group were sacrificed on day 29 or 30 (except only nine high-dose males). All remaining surviving rats were sacrificed on day 92 or 93. Gross postmortem examinations were done on all treated and control animals. Organ weights were recorded at terminal sacrifice. A complete histopathologic examination was done on all rats sacrificed at the end of the study in the control and the high-dose groups; on livers, kidneys, and lungs from the rats in the 5 and 15 mg/kg/day dose groups; the livers from rats necropsied at the interim sacrifice and on all gross lesions. In addition, a complete histopathologic examination was conducted on all rats found dead.

STATISTICAL METHODS The data were tested for homogeneity of variance by Bartlett's method (Snedecor and Cochran, 1967). If the data were found to be homogeneous, differences between control and treatment means were tested for statistical significance by the method of Dunnett (Dunnett, 1964). If the data were found not to be homogeneous, the

method of Gill (modified Dunnett's) was employed (Gill, 1977).

Result :

EFFECTS AFTER FOUR WEEKS
Effects during the first four weeks of the study the effects were:
(1) Death of one male in the 50 mg/kg/day dose group
(2) An increasing incidence of salivation in the 50 mg/kg/day dose group
(3) Significantly lower body weights in the high-dose males and a similar trend in the females
(4) A trend toward higher food consumption in the high-dose males that was statistically significant in week 3
(5) Reduced hemoglobin and mean corpuscular hemoglobin in high-dose females and in the high-dose males, lower mean corpuscular volume.
(6) Increased total leucocyte and absolute neutrophil count for the high-dose males,
(7) Higher than normal values in two high-dose males and one high-dose female for the SGOT, SGPT and LDH
(8) Reduced serum glucose and sodium in the high-dose males
(9) Mottling and light or dark areas in the livers of some high-dose males
(10) Histologically, megalocytosis of hepatocytes in both sexes of the 15 and 50 mg/kg/day dose groups.

EFFECTS AFTER 13-WEEKS

After 13-weeks, four males from the high-dose dose group had died. Salivation was the most prevalent treatment-related clinical sign, occurring predominately prior to dosing in the high-dose dose group.

BODY WEIGHTS Body weights of high-dose males were 16% lower ($p<0.01$) than controls and high-dose females were 9% (not significant) lower. There was a tendency toward increased food consumption in the mid and high-dose groups.
No treatment-related effect was observed upon ophthalmoscopic examination.

HEMATOLOGY High-dose males had reduced hemoglobin, mean corpuscular volume, mean corpuscular hemoglobin concentration. High-dose females showed reduced mean corpuscular volume and mean corpuscular hemoglobin. In addition, the absolute neutrophil count was higher in mid and high-dose males.

CHEMISTRY High-dose males and females had increased SGOT, SGPT and Alk Phos. Serum glucose and sodium concentrations were lower than controls for high-dose males. Serum cholesterol was reduced in high-dose males compared to controls. Serum albumin and globulin in the males and globulin in the females was lower for the high-dose group. Serum creatinine levels were lower than controls for high dose males and females.

ORGAN WEIGHTS Absolute and relative liver weights of mid and high-dose males and females were greater than controls. In the low dose males and females, the absolute and relative liver weights of both sexes were higher than controls but not significantly so. Absolute kidney weights of mid and high-dose females and the relative kidney weighs of high-dose males were increased.

HISTOPATHOLOGY Liver and kidneys were the most affected organs. The predominant hepatic lesion was megalocytosis of hepatocytes with a

less prominent proliferation of the bile ducts and hepatocytic cytoplasmic vacuolation. This occurred in all high-dose rats treated for one or three months, in all mid-dose rats treated for thirteen weeks and in 9/10 mid-dose males and 5/10 mid-dose females treated for four weeks. In the low-dose group hepatocytic megalocytosis was seen in one rat treated for thirteen weeks. The most prevalent renal lesion was karyomegaly (enlarged nuclei) of renal tubular epithelial cells. The incidence and grade of renal karyomegaly showed a dose response effect, occurring in the mid and high-dose groups of males and in the high-dose females. The low-dose group dose group was not affected.

Test substance :

Propargyl alcohol, CASNO 107-19-7, purity >99%

Conclusion :

Administration of 15 or 50 mg/kg-day of Propargyl alcohol to rats for 13-weeks was associated with significant adverse effects on the liver and kidneys at 50 mg/kg and potentially adverse effects seen by histopathology at 15 mg/kg-day. The 50 mg/kg-day dose in males also was associated with reduced body weight gain, 20% mortality and reduction in hemoglobin, mean corpuscular volume and corpuscular hemoglobin. The low-dose, 5 mg/kg-day, was a NOAEL.

Reliability : (1) valid without restriction
Guideline-like study under GLPs with good documentation. Full report available for review.

Flag : Critical study for SIDS endpoint
30.12.2002 (29)

Type : Sub-chronic
Species : mouse
Sex : male/female
Strain : B6C3F1
Route of admin. : inhalation
Exposure period : 13-weeks
Frequency of treatm. : daily
Post exposure period :
Doses : 0, 2, 4, 8, 16 and 32 ppm
Control group :
NOAEL : = 8 ppm
LOAEL : = 16 ppm
Method : other: NTP SOW
Year :
GLP : yes
Test substance :

Method : Male and female B6C3F1 (10/sex/group) were exposed by whole-body inhalation to target concentrations of 0, 4, 8, 16, 32, or 64 ppm propargyl alcohol for up to 13 weeks.

Exposure was 5 days per week; however, the number of hours exposure per day is not available in the abstract. The NTP statement of work specifies conducting studies at a 6-hour/day exposure. The actual protocol is archived at the NTP and, if necessary, could be obtained.

Result :

Results of the study in mice are summarized below

EFFECTS MALE MICE
Mortality and 13-week body weights

	Exposure Concentration (ppm)					
	0	4	8	16	32	64
Mortality	0/10	0/10	0/10	0/10	0/10	0/10
Abnor Bre'ing	0/10	0/10	0/10	0/10	0/10	8/10
Body wt [g]	39.8	38.6	37.9	36.4*	35.3*	33.6*
± SD	±2.7	±1.3	±2.4	±2.9	±2.1	±1.6
% Difference	NA	-2.9	-4.7	-8.5	-11.3	-15.6

Necropsy Findings	Exposure Conc (ppm)					
	0	4	8	16	32	64
Gross observations	NS	NS	NS	NS	NS	NS
Increased kidney/body wt	NA	NS	+	++	++	++
Increased liver/body wt	NA	NS	NS	+	+	++

Clinical Pathology Findings	Exposure Conc (ppm)					
	0	4	8	16	32	64
Decreased RBCs	NA	NS	NS	NS	+	++
Decreased Hb	NA	NS	NS	NS	++	++
Decreased PCV	NA	NS	NS	NS	++	++

Histopathology	Exposure Conc (ppm)					
	0	4	8	16	32	64
Inflamation, nose	0/10	0/10	0/10	0/10	0/10	6/10
Hyperplasia glands, nose	0/10	0/10	0/10	3/10	9/10	9/10
Necrosis, olfactory epithelium, nose	0/10	0/10	1/10	0/10	1/10	0/10
Atrophy, olfactory epithelium, nose	0/10	0/10	0/10	0/10	8/10	10/10
Hyaline Degeneration resp'tory epit'm nose	0/10	0/10	0/10	0/10	3/10	9/10
Squamous metaplasia resp'tory epit'm nose	0/10	0/10	0/10	0/10	5/10	10/10

+ = Sig at < 0.05
++ = Sig at < 0.01

EFFECTS FEMALE MICE
Mortality and 13-week body weights

	Exposure Concentration (ppm)					
	0	4	8	16	32	64
Mortality	0/10	0/10	0/10	0/10	0/10	0/10
Abnor Bre'ing	0/10	0/10	0/10	0/10	0/10	10/10
Body wt [g]	31.8	32.0	31.2	31.3	29.6	28.1*
± SD	±2.7	±2.4	±3.5	±3.3	±1.2	±1.4
% Difference	NA	+0.8	-2.0	-1.5	-7.0	-11.7

Necropsy Findings	Exposure Conc (ppm)					
	0	4	8	16	32	64

Gross observations	NS	NS	NS	NS	NS	NS
Increased kidney/body wt	NA	NS	NS	NS	++	++

Histopathology	Exposure Conc (ppm)					
	0	4	8	16	32	64
Inflamation, nose	0/10	0/10	0/10	0/10	1/10	10/10
Hyperplasia glands, nose	0/10	0/10	0/10	0/10	8/10	10/10
Necrosis, olfactory epithelium, nose	0/10	0/10	0/10	9/10	4/10	0/10
Atrophy, olfactory epithelium, nose	0/10	0/10	0/10	0/10	7/10	10/10
Hyaline Degeneration resp'tory epit'm nose	0/10	0/10	0/10	0/10	7/10	8/10
Squamous metaplasia resp'tory epit'm nose	0/10	0/10	0/10	1/10	7/10	10/10

+ = Sig at < 0.05
++ = Sig at < 0.01

Propargyl alcohol exposure for 13 weeks induced significantly depressed body weights among 16-ppm and higher level male mice and 64-ppm female mice. The 64-ppm mice showed signs of abnormal breathing on Days 8 and 9. A mild nonregenerative anemia was reported in males after 13 weeks of exposure to 32 or 64 ppm. Liver to body weight ratios were elevated in males exposed at 16 ppm and higher. Relative kidney weights were also elevated among males exposed at 8 ppm and higher, and females exposed at 32 or 64 ppm. Although all these organ weight changes were significant, they were confounded by concomitant propargyl alcohol effects involving body weight reduction. Overall, these results indicate that males were more sensitive to the toxic effects of the test material.
No gross lesions related to exposure were observed at necropsy. Significant histopathology findings occurred only in the nose. All nasal lesions, except for necrosis of the olfactory epithelium, were clearly exposure-related. Inflammation was restricted to the 64-ppm exposure level, except for a single 32-ppm female. Excluding the single observation of necrosis of the olfactory epithelium in a 8-ppm male, a no-effect level of 8 ppm could be determined.

Test substance :
Propargyl alcohol, CASNO 107-19-7, purity >99.6%

Reliability : (1) valid without restriction
NTP Guideline study under GLP with full QA reviews

Flag : Critical study for SIDS endpoint

24.07.2003 (24)

Type : Sub-chronic
Species : rabbit
Sex : male/female
Strain : no data
Route of admin. : dermal
Exposure period : 90 days
Frequency of treatm. : daily, except weekends
Post exposure period :

Doses	:	1, 3, 10 (20) mg/kg-bw
Control group	:	yes, concurrent vehicle
NOAEL	:	= 13.3 mg/kg bw
Method	:	
Year	:	1965
GLP	:	no
Test substance	:	

Method :

Thirty-six albino rabbits (2-3 kg) were obtained and observed for a period of two weeks to assure health. The animals were then divided into four groups.

Control,	10 animals, 5 each sex;
1 mg/kg-day,	8 animals, 4 each sex
3 mg/kg-day,	8 animals, 4 each sex
10 (20) mg/kg-day,	10 animals, 5 each sex

In each group, half the animals of each sex were exposed with intact skin and half with abraded skin. The test material was applied as w/v solutions in distilled water using 1.0%, 0.3% and 0.1% for high to low groups respectively. Beginning on the 63rd day the daily dosage applied to high-dose animals was doubled, using a 2.0% solution. All dosages were applied in four equal increments, equally spaced through the day, five days per week. All animals were confined throughout each 8-hour exposure day. Control animals were handled in a manner similar to the test animals with distilled water applied four times daily.

Animals were weighed twice weekly during the first four weeks of the study and weekly thereafter, and doses were adjusted. Hematology (hemoglobin, red blood cell count, white blood cell count, differential count) was performed prior to the experiment, at 45-days and at termination. Determination of alkaline phosphatase, blood urea nitrogen (BUN) and serum glutamic pyruvic transaminase (SGPT) were performed prior to the start of the experiment, at 14-days and at 80-days.

At termination each animal was given a complete gross necropsy and organ weights of liver, kidney, Brain, adrenal, heart, spleen, stomach, testis (m), ovary (f) were recorded.

Sections of several organs were fixed, section and examined microscopically in controls and high-dose animals. These were: Brain, adrenal, heart, spleen, stomach, small intestine, pancreas, liver, kidney, gonads and skin.

Remark :

This study has a high level of documentation available with individual animal data for body weights, hematology, and pathology being presented. Summary tables are not included nor is any description of the statistical methods. With the small numbers of animals and without statistical evaluation a firm conclusion cannot be drawn concerning minor systemic effects. The histopathological evaluations on the high-dose animals are valuable and demonstrate lack of specific organ toxicity under these conditions.

The dosing regime of 4 doses/day is unusual.

Result :

No deaths occurred during the study. Analysis of the weight changes shows that there were no patterns of response attributable to the dosages

applied. Neither the sex of the animals nor the condition of the skin at application (abraded or intact) appears to have any significant effect upon the experimental animals' weight changes as compared to those of the control animals

No significant treatment-related observations were made upon gross examination of the animals at necropsy. No significant treatment-related differences between tissues from control and treated rabbits were found.

Analysis of the values obtained for alkaline phosphatase, BUN, and SGPT shows there to be no significant difference between any of the experimental groups as compared to the control group.

Hematological findings in the experimental animals did not differ significantly from those of the control animals. All were within the normal limits for the species.

Test substance :

Propargyl alcohol, CASNO 107-19-7

Conclusion :

Application of Propargyl Alcohol to the intact or abraded skin of young adult rabbits in daily doses of up to 10 mg/kg over a 63-day period and up to 20 mg/kg over a 28-day period produced no systemic effects.

Reliability : (4) not assignable
30.12.2002 (22)

5.5 GENETIC TOXICITY 'IN VITRO'

Type	:	Ames test
System of testing	:	S. typhimurium
Test concentration	:	4 to 2500 micrograms per plate
Cycotoxic concentr.	:	2500 mcg/plt without S9, 500 mcg/plt with S9
Metabolic activation	:	with and without
Result	:	negative
Method	:	
Year	:	
GLP	:	no data
Test substance	:	

Method :

S. typhimurium strains TA1535, TA1538, TA100, TA1537, TA98 were tested using a plate incorporation technique both with and without metabolic activation. Aroclor 1254 induced rat liver S-9 was used for metabolic activation at a rate of 0.5 ml S-9 per plate when used with the overlay procedure. Test and control materials were incorporated directly into the overlay agar with the bacteria.

Plates were prepared and read in quadruplicate and a confirmatory assay was conducted to add additional dose levels).

Concentrations of test substance were tested from 4 to 2500 micrograms per plate with up to 7 different concentrations. The second study expanded the concentration range that was tested.

Statistical Methods

Formal statistical methods were not used to evaluate the data. Evaluations considered if a dose-response was observed and the magnitude of any

increase in revertants..

Result :

In the initial study it was determined that the test material was slightly toxic to the test strains at 2500 micrograms/plate in the absence of S9. In the presence of S9, however, the test material displayed toxicity at levels of 500 microgram and above.

The results of the initial and independent assays conducted on the test material at dose levels ranging from 4 to 2500 micrograms per plate in the absence and presence of metabolic activation did not exhibit increased numbers of his+ revertant colonies.

The positive control treatments (without S9: MMNG, TA1535, TA1538, TA98 and TA100; 9-Aminoacridinumchloride, TA1537. with S9: Cyclophosphamide, TA1537, TA100; 2-Aminoanthrecene, TA1535, TA1537, TA1538, TA98 and TA100) in both the nonactivation and S9 activation assays induced large increases in the revertant numbers with all indicator strains, which demonstrated the effectiveness of the S9 activation system and the ability of the test system to detect known mutagens.

Test substance :

Propargyl alcohol, CASNO 107-19-7, purity ca. 99%

Conclusion :

The test material, Propargyl alcohol, did not exhibit genetic activity in any of the assays conducted in this evaluation and was not mutagenic to the Salmonella typhimurium indicator organisms under the test conditions.

Reliability : (1) valid without restriction
Guideline-like study with good documentation. As the study was conducted in 1979, the GLP satus cannot be determined.

Flag : Critical study for SIDS endpoint
21.07.2003 (7)

Type : Ames test
System of testing :
Test concentration :
Cycotoxic concentr. : 0.75 mcl/plate
Metabolic activation : with and without
Result : negative
Method :
Year :
GLP : no data
Test substance :

Method : The 3 chemicals were tested for reverse mutation in Salmonella strains TA97, TA98, TA10o and TA102 both with and without metabolic activation using Aroclor-induced Sprague-Dawley rat liver S9 mix (Moron and Ames, 1983). To avoid artifactual results due to test chemical-solvent interactions, each chemical was tested using at least 2 solvents.

Tester strains used were TA97, TA98, TA100 and TA102. Five dose levels between 0.0075 and 0.75 mcl/plate were used to expose bacteria with and without S9 mix. The highest dose produce signs of toxicity in at least one strain. The test was run twice, once with DMSO as solvent and once with water as solvent.

Data from the Salmonella/mammalian microsome assay were analyzed using the Salanal computer program developed by Integrated Laboratory Systems.

Result	:	Although the highest dose tested was sufficient to show signs of toxicity in at least one strain, The test material did not induce a reproducible, statistically-significant, dose-related increase in reverse mutations in any of the strains tested.
Test substance	:	Propargyl alcohol, CASNO 107-19-7 purity 97% (source: Aldrich Chemicals)
Reliability	:	(2) valid with restrictions Acceptable Publication

30.12.2002 (14)

Type	:	Chromosomal aberration test
System of testing	:	CHO Cells
Test concentration	:	0.4 to 10.0 mM
Cycotoxic concentr.	:	
Metabolic activation	:	with and without
Result	:	positive
Method	:	
Year	:	
GLP	:	no data
Test substance	:	

Method :

Cell culture. Wild-type Chinese hamster ovary (CHO) cells were maintained in Eagle MEM supplemented with 1% sodium pyruvate, 1% non-essential amino acids and 10% fetal calf serum; (complete medium; all Gibco, Burlington, Ont.) at 37°C, 5% CO2 and high humidity.

Treatment. 20000 CHO cells were added to 5 ml complete medium in 60-mm culture dishes and incubated as above overnight. For treatment, the complete medium was replaced with 1.4 ml treatment medium consisting of the test chemical diluted in either serum-free complete medium or an exogenous metabolic activation medium prepared as follows: 82% serum-free complete medium; 5.4% 20 mM HEPES buffer pH 7.2; 0.2% 0.5 M MgCl2; 0.2% 3.3 M KCI; 2% 40 mM NADP; 2% 50 mM glucose 6-phosphate; and 7% Aroclor 1254-induced rat-liver homogenate (S9). Vehicle controls were treated with treatment medium without the test chemical. The positive control was either 1 mM methyl methanesulfonate 5 mcg/ml mitomycin C for tests without metabolic activation and 25 mcg/ml cyclophosphamide for tests with metabolic activation. The cells were treated for 1 h then washed 3 times with Earle's balanced salt solution and incubated as above in 5 ml complete medium for 10 or 16 hr. Colcemid was added to all cultures for the final 2 hr of incubation. The cells were then scraped from the dishes using a rubber spatula, centrifuged at 1000 rpm for 5 min, resuspended in hypotonic 0.075 M KCI for 12 min at 37°C, centrifuged as above then resuspended in 3:1 ethanol-acetic acid. Chromosome preparations were made using standard cytological techniques then stained with 4% Giemsa (Gun R66 improved). 100 metaphase cells were scored from each of two cultures for each treatment. The slides were coded and scored blind to avoid observer bias.

Chromosomal aberration were analysed using Chromosomal Aberration Assay Data Management and Analysis System (Version 1.4) and the Micronucleus Assay Data Management and Analysis System (Version 1.4) developed under contract to the U.S. Environmental Protection Agency (Pellom et al., 1990). The criteria for a positive response were: a statistically significant, dose-related increase; and at least one dose that is

statistically different from the solvent control.

Result :

In cells collected 16 h following treatment, Propargyl alcohol induced a small but statistically-significant ($p < 0.05$) increase in chromosomal aberrations in the absence of metabolic activation (concentration range 0.04 to 1.0 mM). Although only the response at the highest dose was significantly higher than the control, there was a positive trend. In the presence of metabolic activation, a larger, dose-related increase ($p < 0.001$) was induced (concentration range 1.0 to 10.0 mM). This effect was confirmed in two repeat experiments. In cells sampled 10 h following treatment, there was no increase in chromosomal aberrations, either with or without metabolic activation.

Test substance :

Propargyl alcohol, CASNO 107-19-7 purity 97% (source: Aldrich Chemicals)

Reliability : (2) valid with restrictions
Acceptable Publication

30.12.2002 (1)

5.6 GENETIC TOXICITY 'IN VIVO'

Type : Micronucleus assay
Species : mouse
Sex : male/female
Strain : NMRI
Route of admin. : gavage
Exposure period : 24, 48 and 72 hours
Doses : 0, 70 mg/kg
Result : negative
Method : OECD Guide-line 474 "Genetic Toxicology: Micronucleus Test"
Year :
GLP : yes
Test substance :

Method : Thirty-five seven-week old mice of each sex were randomized into 7 groups containing 5 males and 5 females. Three groups were dosed with test substance at 70 mg/kg, three groups were treated with vehicle and served as controls and one group was treated with the positive control substance Cyclophosphamid at 50 mg/kg. The dosage of 70 mg/kg was determined in a preliminary experiment to be the highest non-lethal dose by this route for these animals.

The test compound dilutions were prepared fresh each day. 175 mg Propargylalkohol was weighed into a 25 ml flask, mixed with deionized water and filled to the calibration mark to make the dosing solutions at 0.7% w/v. Animals were dosed with a volume of 10 ml/kg-bw. Animals were killed by carbon dioxide asphyxiation 24, 48 or 72 hours after application. For each animal, about 3 ml fetal bovine serum was poured into a centrifuge tube. Both femora were removed and the bones freed of muscle tissue. The proximal ends of the femora were opened and the bone marrow flushed into the centrifuge tube. A suspension was formed and centrifuged for 5 minutes at 1200 rpm and almost all of the supernatant was discarded. One drop of the thoroughly mixed sediment was smeared on a cleaned slide, identified by project code and animal number and air-dried for about 24 hours prior to staining.

1000 polychromatic erythrocytes were counted for each animal. The number of cells with micronuclei was recorded, not the number of individual micronuclei. As a control measure 1000 mature erythrocytes were also counted and examined for micronuclei. In addition, the ratio of polychromatic to normochromatic erythrocytes was determined. All bone marrow smears for evaluation are coded to ensure that the group to which they belonged remains unknown to the investigator. The number of polychromatic erythrocytes with micronuclei occurring in the 1000 polychromatic erythrocytes counted, and the number of normocytes with micronuclei occurring in the 1000 normocytes counted, were evaluated statistically; comparison of dose groups with the simultaneous control group was performed according to Wilcoxon (paired, one-sided, increase). The results of the treatment groups (test substance) in the micronucleus test at each dose and killing time were compared with corresponding control values. The ratio of polychromatic to normochromatic erythrocytes was also evaluated statistically by the method of Wilcoxon (paired, two sided). The statistical evaluations were performed using the "Diamant" computer program Version 2.0, supplied by the Department of Information and Communication Hoechst AG. All statistical results are based on a 95 % level of significance. Data were also compared with historical controls.

Remark :

Also in support of this finding are data from the National Toxicology Program 90 day mouse study. Micronucleus data were collected from groups of 10 male and female mice exposed to either 0 or 64 ppm Propargyl alcohol for polychromatic erythrocytes; or exposed to 0, 4, 8, 16, 32 or 64 ppm Propargyl alcohol for normochromatic erythrocytes, by inhalation for 90 days. There was no increase in the number or percent of micronucleated cells. (National Toxicology Program, unpublished results)

Result : All animals survived the administration 70 mg Propargyl alkohol per kg bodyweight. Narrowed palpebral fissures and reduced spontaneous activity were reported the first 2 hours after application, after that, all animals were free of clinical signs of toxicity. The bone marrow smears were examined for the occurrence of micronuclei in red blood cells.

Only the female mice of the 24 and 72 hours killing times showed a very small but statistically significant increase in the number of micronucleated polychromatic erythrocytes. The increase was within the normal range of the negative control values and therefore considered as of no toxicological significance. The number of normochromatic erythrocytes containing micronuclei was not increased. The ratio of polychromatic erythrocytes to normocytes remained essentially unaffected by treatment. Cyclophosphamid induced a marked and statistically significant increase of the number of polychromatic erythrocytes with micronuclei in both males and females indicating the sensitivity of the test system.

Micronulei: Mean polychromatic erythrocytes containing micronuclei were:

Negative control (range)	0.06-0.18%
Males 70 mg/kg (24 hrs)	0.24%
Females 70 mg/kg (24 hrs)	0.32%*#
Males 70 mg/kg (48 hrs)	0.04%
Females 70 mg/kg (48 hrs)	0.16%
Males 70 mg/kg (72 hrs)	0.22%
Females 70 mg/kg (72 hrs)	0.18%*#
Male Pos control (24 hours)	2.58%*
Female Pos control (24 hours)	2.24%*

*= Statistically different from concurrent control.
= within the normal range of historical controls

Test substance :

Propargyl alcohol, CASNO 107-19-7, purity 99.4% (Containing 0.48% formaldehyde an 0.03% water)

Conclusion :

Under the conditions of this study, administration of Propargyl alcohol did not lead to a substantial increase in micronucleated polychromatic erythrocytes. It is concluded that Propargyl alcohol is not mutagenic in the mouse micronucleus test.

Reliability : (1) valid without restriction
Guideline study under GLPs with good documentation.

Flag : Critical study for SIDS endpoint
30.12.2002 (21)

Type : Micronucleus assay
Species : mouse
Sex : male/female
Strain : C57BL
Route of admin. : gavage
Exposure period : 36 hours after second treatment
Doses : 24, 48 or 72 mg/kg-bw
Result : negative
Method :
Year :
GLP : no data
Test substance :

Method : Animals: Five 17 week old C57BL mice (Charles River) of each sex were included in each treatment group. Prior to treatment, the animals were acclimatized to the laboratory for several weeks. The handling and treatment of animals were approved by the Health Protection Branch Animal Care Committee, Department of National Health and Welfare.

Treatment: The animals were treated by gavage. Test chemical was dissolved or suspended in USP grade olive oil at a concentration that would allow the delivery of the chemical at a rate of 10 ml/kg bw. Vehicle controls received only olive oil and positive control animals received 45 mg/kg cyclophosphamide by i.p. injection using sterile saline as the vehicle. The doses selected for testing were equal to 25, 50 and 75% of the LD50 determined in a preliminary experiment using the same treatment regimen used in the micronucleus assay. These dose levels were 24, 48 or 72 mg/kg.
Mice were treated with test substance twice, 24 h apart, then sacrificed by cervical dislocation approximately 36 h following the second treatment. Bone marrow was collected by flushing one femur from each animal with approximately 0.3 ml fetal bovine serum containing EDTA. The resulting cell suspension was thoroughly mixed using a wooden applicator stick and smears were prepared on clean glass slides. The slides were air dried, fixed in absolute methanol for 5 min, then stained with an Ames Hema-Tek slide stainer using Harleco Wright's stain. 500 polychromatic erythrocytes (PEs) from each animal were scored for the presence of micronuclei. In addition, the ratio of polychromatic to nonnochromatic erythrocytes was determined by counting the number of normochromatic erythrocytes (NEs) encountered during the scoring of 500 PEs. The slides were coded and scored blind.

Micronucleus data were analysed using Chromosomal Aberration Assay Data Management and Analysis System (Version 1.4) and the Micronucleus Assay Data Management and Analysis System (Version 1.4) developed under contract to the U.S. Environmental Protection Agency (Pellom et al., 1990). The criteria for a positive response were: a statistically significant, dose-related increase; and at least one dose that is statistically different from the solvent control.

Result :

The results showed that Propargyl alcohol did not induce micronuclei in vivo. There was no significant increase in cells with micronuclei. All five males treated with 72 mg/kg twice, died before the scheduled collection of bone marrow. The positive control substance, cyclophosphamide, produced a significant increase in cells with micronuclei.

Test substance :

Propargyl alcohol, CASNO 107-19-7 purity 97% (source: Aldrich Chemicals)

Reliability : (2) valid with restrictions
Acceptable Publication

30.12.2002 (14)

5.7 CARCINOGENICITY

5.8.1 TOXICITY TO FERTILITY

5.8.2 DEVELOPMENTAL TOXICITY/TERATOGENICITY

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